

PACKAGING SUBSTRATE AND MANUFACTURING METHOD THEREOF,
INTEGRATED CIRCUIT DEVICE AND MANUFACTURING METHOD THEREOF,
AND SAW DEVICE

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Background of the Invention:

5 The present invention relates to a packaging substrate and a
manufacturing method thereof, an integrated circuit device and a
manufacturing method thereof, and an SAW device, in particular to a technique
effectively applicable to the packaging substrate on which an integrated circuit
10 element is mounted by flip-chip bonding, a technique effectively applicable to
the integrated circuit device that an integrated circuit element is hermetically
sealed on the packaging substrate, a technique effectively applicable to the
integrated circuit device that an integrated circuit element and the packaging
substrate are coupled with each other by ultrasonic sound, and a technique
15 effectively applicable to the SAW device which has a pair of resonators each
having a shape of the teeth of a comb.

In the integrated circuit device that an integrated circuit element is
mounted on the packaging substrate, a flip-chip method is considered as one of
mounting methods thereof. In the flip-chip method, projecting electrodes are
20 formed on element electrodes of the integrated circuit element, and then the
projecting electrodes are directly coupled to substrate electrodes formed on a
packaging substrate. Further, a wire-bonding method is also considered as
another one of the mounting methods thereof. In the wire-bonding method,
the integrated circuit element is coupled to the packaging substrate, and then
25 the element electrodes of the integrated circuit element and the substrate
electrodes of the packaging substrate are coupled to each other through wires.

Herein, in the wire-bonding method that a wire-bonding is carried out
by the use of gold (Au) wiring, aluminum (Al) wiring, or the like, the substrate
electrodes formed on the packaging substrate, in particular on the packaging

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